NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Activity 4.2A

1. Get a partner, and one tape measure per pair.
2. Measure the following things on your partner, and have them measure the same thing on you ***(all in centimeters)***. Record ***YOUR*** measurements below:

HEIGHT: \_\_\_\_\_\_\_\_\_\_\_\_\_ cm

ARM SPAN: \_\_\_\_\_\_\_\_\_\_\_\_\_ cm

SHOULDER to ELBOW: \_\_\_\_\_\_\_\_\_\_\_\_ cm

KNEECAP to FLOOR: \_\_\_\_\_\_\_\_\_\_\_\_\_ cm

1. Record ***YOUR*** measurements on the board with the class data
2. Input the class data into your calculator. First, create the following lists for the data:

HEIGHT = **LHGT**

ARM SPAN = **LARM**

SHOULDER to ELBOW = **LSHOLD**

KNEECAP TO FLOOR = **LKNEE**

\*\* You can help divide up the work with your partner. You can each type in 2 lists, then transfer them to each other \*\*

1. Height will be our response variable (y-variable) for this entire activity. We want to see which of the other 3 variables will ***best predict*** a person’s height.

**First, let’s look at Arm Span:**

1. Create a plot for ARM SPAN vs. HEIGHT and sketch it below.
2. Calculate the LSR line, the r, and the r2 values.
3. Based on the plot and the r and r2 values, do you think that arm span does a good job predicting height? WHY??? (justify)
4. Create a residual plot for this analysis and sketch it below.
5. Based on the residual plot, do you think that arm span does a good job predicting height in a linear model? Why??

**Next, let’s look at Shoulder to elbow:**

1. Create a plot for SHOULDER TO ELBOW vs. HEIGHT and sketch it below.
2. Calculate the LSR line, the r, and the r2 values.
3. Based on the plot and the r and r2 values, do you think that shoulder to elbow does a good job predicting height? WHY??? (justify)
4. Create a residual plot for this analysis and sketch it below.
5. Based on the residual plot, do you think that shoulder to elbow does a good job predicting height in a linear model? Why??

**Next, let’s look at Kneecap to floor:**

1. Create a plot for KNEECAP TO FLOOR vs. HEIGHT and sketch it below.
2. Calculate the LSR line, the r, and the r2 values.
3. Based on the plot and the r and r2 values, do you think that kneecap to floor does a good job predicting height? WHY??? (justify)
4. Create a residual plot for this analysis and sketch it below.
5. Based on the residual plot, do you think that kneecap to floor does a good job predicting height in a linear model? Why??
6. Let’s compare the 3 models for predicting height. Look at the three different *r* values, r2 values, and residual plots. Which explanatory variable (arm span, shoulder to elbow, or kneecap to floor) does the best job of predicting height? WHY??? (JUSTIFY!!)
7. Using the model you chose in #21, predict how tall Mrs. McNelis is (get her measurement for the model you chose). Show work below:
8. Find out her actual height. Calculate the residual (error) for your predication.